

CLAIMS

2 As will be apparent to those skilled in the art in the light of the foregoing
disclosure, many alterations and modifications are possible in the practice of this
4 invention without departing from the spirit or scope thereof. Accordingly, the
scope of the invention is to be construed in accordance with the substance
6 defined by the following claims.

8

What is claimed is:

10

1. An multi-cycle, reciprocating piston-type internal combustion engine
12 comprising; at least one master cylinder which includes a reciprocating piston
being connected to a crankshaft, and at least one slave cylinder which includes a
14 reciprocating piston being connected to said crankshaft; and an overhead valve
means for, admission of gases of air and fuel mixture to said master cylinder and
16 admission of air only to said slave cylinder and discharge of exhaust gases from
said slave cylinder, wherein the engine comprises at least two cylinders disposed
18 to form a pair, one said master cylinder adjacent the other said slave cylinder,
with a coordinate means, for coordinating gases between said master cylinder
20 and adjacent said slave cylinder.

22 2. An internal combustion engine of claim 1, where said coordinating means for
coordinating exchange of gases between said master cylinder and said slave
24 cylinder, is a coordinate valve means at said master cylinder side, where said
valve means includes; a passage port means of sufficient size to permit gases
26 therethrough between said slave cylinder and said master cylinder, and for
channelling gases through said valve from said master cylinder to said slave
28 cylinder.

30 3. An internal combustion engine according to claim 2, in which said coordinate
valve means opens at approximately 420 degrees of cycle revolution, where the

slave cylinder's compressed air can begin to flow into said master cylinder. When
2 engine rotation is at approximately 450 degrees of cycle revolution, all said
compressed air in said slave cylinder will come into said master cylinder.

4

4. An internal combustion engine of claim 3, where said compressed air from
6 said slave cylinder will combine with heat energy from said master cylinder in
said slave cylinder to produce a second power cycle through said coordinate
8 valve without addition of fuel.

10 5. An internal combustion engine according to claim 1, where said master
cylinder and said slave cylinder are operating 60 degrees to 120 degrees apart,
12 with said slave cylinder trailing said master cylinder.

14

6. An internal combustion engine according to claim 1, wherein said two cylinders
16 are disposed along a line, adjacent the crankshaft to which they are connected.

18 7. An internal combustion engine according to claim 1, wherein said two cylinders
are disposed in a V cylinder configuration, adjacent the crankshaft to which they
20 are connected.

22 8. An internal combustion engine according to claim 1, comprising a multiple of
said master cylinder and said slave cylinder pairs.

24

9. An internal combustion engine according to claim 2, wherein a second
26 coordinating valve means is located overhead of said slave cylinder working with
said coordinating valve means above said master cylinder.

28

10. An internal combustion engine as claimed in claim 1, wherein said engine is
30 an engine of a type of charged intake.

11. An eight-cycle, reciprocating piston-type internal combustion engine having;
a basic unit comprising at least one four-cycle master cylinder and a piston, and
at least one four-cycle slave cylinder and a piston, provided with means for
introducing and firing a fuel-air mixture for said master cylinder, means for
introducing air for said slave cylinder, including means for transferring expansion
gases between said master cylinder and said slave cylinder and means for
coordinating expansion gases between said master cylinder; and to produce a
second power stroke from said slave cylinder, and including exhaust passage
means from said slave cylinder to outside; and where said master cylinder and
said slave cylinder are operating between 60 and 120 degrees apart with said
slave cylinder trailing said master cylinder.

12. An internal combustion engine of claim 11, where said coordinating means
for coordinating exchange of expansion gases between said master cylinder and
said slave cylinder, is a coordinating valve means at said master cylinder side;
where said coordinating valve means includes a passage port means between
said master cylinder and said slave cylinder, for channelling expansion gases
from said slave cylinder through said coordinating valve to said master cylinder,
and said master cylinder expansion gases to said slave cylinder.

13. An internal combustion engine according to claim 12, in which said
coordinate valve means opens at approximately 420 degrees of cycle revolution,
where slave cylinder's compressed air can begin flow into said master cylinder.
When engine rotation is at approximately 450 degrees of cycle revolution, all said
compressed air in said slave cylinder will come into said master cylinder.

14. An internal combustion engine of claim 13, where said compressed air from
said slave cylinder will combine with heat energy from said master cylinder in
said slave cylinder to produce said second power cycle without addition of fuel.

15. An internal combustion engine according to claim 11, where said master
2 cylinder and said slave cylinder are operating 90 degrees apart, with said slave
cylinder trailing said master cylinder.
- 4
16. An internal combustion engine according to claim 11, wherein said master
6 cylinder and said slave cylinder are disposed along a line, adjacent the
crankshaft to which they are connected.
- 8
17. An internal combustion engine according to claim 11, wherein said master
10 cylinder and said slave cylinder are disposed in a V cylinder configuration,
adjacent the crankshaft to which they are connected.
- 12
18. An internal combustion engine according to claim 11, comprised of multiples
14 pairs of said master cylinder and said slave cylinder.
- 16
19. An internal combustion engine according to claim 12, wherein a second
coordinating valve means is located overhead of said slave cylinder, working with
18 said coordinating valve means above said master cylinder.
- 20
20. An internal combustion engine as claimed in claim 11, wherein said engine is
an engine of a type of charged intake.